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Citizens' Bulletin

Volume 8 Number 3

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Commissioner
Stanley J. Pac

Director Info & Ed
William Delaney

Editor
Margot Callahan

Graphics
Rosemary Gutbrod

Composition
Audrey Verrengia

Circulation
Helen Moriarty - 566-5524

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Law professor to head Heritage Task Force

Governor Ella Grasso has appointed Professor Terry J. Tondro of Hartford chairman of the new Connecticut Heritage Task Force, which is charged with developing, by January 1, 1982, an integrated program for protecting and preserving the State's natural, historical, and cultural resources. Professor Tondro is on the law faculty of the University of Connecticut.

At a Capitol ceremony to welcome and inaugurate Task Force members, who serve by her invitation, Governor Grasso told them, "Our state has been blessed with a wealth of natural, historical and cultural resources. The future of this rich heritage is, in a very real sense, dependent on your efforts to develop guidelines for managing these resources in the future." The Governor also praised Senator Eugene Skowronski, Senate chairman of the General Assembly's Committee on the Environment, for his "leadership, patience, and persistence" in guiding the bill creating the Heritage Task Force through the legislative process.

The twenty-five members of the newly named task force are specialists recommended to the Governor by the Department of Environmental Protection, the Connecticut Historical Commission, and the State Commission on the Arts. Formation of the Task Force was inspired by the U.S. Department of the Interior's National Heritage Program, which coordinates federal, state, and local conservation programs.

The task force's natural resources specialists are Homer D. Babbidge, Jr., Hartford; Russell L. Brenneman, Glastonbury; Dorothy Goodwin, Mansfield; John Hibbard Hebron; Peter Cooper, Bethany; Professor Richard Goodwin, New London; Mary Dishaw, Granby; Ronna L. Reynolds, Manchester; and Sally Taylor, Quaker Hill.

Historical specialists are Chairman Tondro, Hartford; May E. Findlay, New Caanan; Lee G. Kuckro, Wethersfield; Janet G. Jainschigg, Darien; Dr. Herbert F. Janick, Jr.,

Ridgefield; Edmund K. Swigart, Washington; Renee Kahn, Stamford; and Frederick Biebesheimer, East Lyme.

Cultural specialists are Mikki Aganstata, Hartford; Wilson H. Faude, Farmington; Betty Hale, Pomfret Center; Dollie McLean, Hartford; Michael Price, Chester; Frank D. Rich, Darien; Alan Shestack, New Haven; and Susan Kelly, Hartford.

Public Act 80-76 which created it, requires the Task Force to:

1. Recommend policies for protecting and preserving the natural, historical, and cultural resources of the state, and also recommend ways to coordinate the programs of public and private organizations dealing with such resources.

2. Review present procedures for compiling a complete inventory of these resources and recommend new procedures if necessary.

3. Recommend alternatives to present methods of protecting and preserving these resources.

4. Design protection and preservation measures to be carried out at state and local levels.

5. Develop recommendations for establishing and operating an emergency program for protecting endangered resources.

Establishing the Heritage Task Force enables the state to take full advantage of the National Heritage Program, which provides administrative and financial support in the form of grants-in-aid to states setting up programs of this kind. NHP also offers technical assistance and establishes standards for judging the environmental, historical, and cultural significance of a particular resource. If invited to do so, it helps in coordinating state and federal activities or the activities of groups within a state.

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At Pratt Center, kids do things as Pioneers and Indians did them

By Jenny Mead, Massachusetts
Audubon Intern

"Today you're going to make everything that you'll be eating: sherbet, peanut butter cookies, homemade soda, and a special recipe of mine, sweet and sour lamb quarters."

After these words from leader Sharon Brown, the 17 member group quickly disperses to begin different tasks. A group traipses through a field, foraging for the weed, lamb quarters, while one member starts the open fire over which this main dish will be cooked. Several individuals gather around an old-fashioned ice cream maker, taking turns at grinding the ice to make orange sherbet. In a corner of the open bar, four others, using sarsaparilla syrup and carbonated water, fill two dozen brown bottles with homemade sarsaparilla.

Sound like a scene right out of a 17th century home economics class? It is, in a sense. The cooks are 17 children ranging in age from six to 12 years; the location is the Eliot Pratt Education Center in New Milford; and the program is Pioneer Village, a two-week session in which the participants do everything from cooking their own food in Colonial dutch ovens to making their own instruments for a jug band.

Jeff Ferguson, the Pratt Center program director and leader of the sarsaparilla making venture, says that the inspiration for the Pioneer Village program came from his interest in making Colonial toys. "I wanted to be authentic for the kids. I found that if you're really creative, you can use your brains to figure out how to make toys." Through research and ingenuity, Ferguson discovered a number of toys which appeal to the



Jenny Mead photos

campers. Using basic materials, they make French hoops from a piece of rope and two maple sticks; pick-up sticks from twigs; racing cars from wooden spools, rubber bands, and matchsticks; and "flipper-dingers" from hollow-stemmed plants, pipe cleaners, hooks, and balls. Making these toys, says Ferguson, teaches the campers both creativity and the value of recycling. "The kids start to think, 'I don't always have to buy a toy.' They're using their own minds to think of things."

The toy making plan soon led to other Colonial activities, many with the same "back to nature" theme. In addition to cooking several meals and making toys, the participants fashion their own jug band instruments from materials such as wood and pop bottle tops, using hammers made by the staff members. Instruments include kazoos, tambourines, sandblocks, and kettle-drums, although when choosing which instruments to make, says staff member Mary Tippet, "Everybody wanted a drum."

Other activities include watching a sheep-shearing then washing the wool and collecting flowers such as dillweed and black-eyed susans which are used to dye the wool. As a final touch, the campers spin the wool, using coat hangers as spindles. Several afternoon sessions are devoted to making hand-dipped candles, hand loom weaving, and sawing logs with a two-man hand saw. The campers also have an opportunity to grind grain into flour, a valuable activity, says Ferguson, because "it shows kids the connection between products in stores and what's involved in getting them there."

Pioneer Village is only one of the three summer programs offered. Indian Summer, another two-week session, features "activities related to the natural world through the perspective of woodland Indians," says Ferguson. For special ceremonies and other activities, the staff members construct a large teepee and a longhouse, and campers make their own lean-tos by lashing together tree boughs. Ferguson's interest in old-fashioned toys carries over to this session, with the campers making Indian toys such as ring tosses and buffalo roarers. A rectangular piece of wood attached to a cord which makes a roaring sound when spun, the buffalo roarer was used in rain making by medicine men who, believing

that the roaring was the voice of the wind, would call upon the wind to produce rain. There are authentic Indian games and lessons in bow and arrow shooting, making Indian jewelry, and starting fires with Indian bowdrills. To get a sample of Indian foods, the campers pound their own corn to make Johnny-cakes and make wild teas such as birch bark tea.

Two Summer Adventure sessions feature pond fishing, nature games, bird studies, cooking with solar cookers, and making wild sumac lemonade. "There's no real theme to these sessions," says Ferguson and, as in the other programs, the emphasis is on individual talent and creativity. "Each kid has his own interest or ability, and we look for what's unique about them," says Tippet. No camper is forced to participate in an activity, and this lack of pressure has positive effects, according to Ferguson. "After their first day or two here, the kids start to feel very comfortable, as though it's their own place."

Established in 1967 by the Eliot Pratt family, the center has a focus which is more environmental education than traditional nature center. Programs and activities for all ages are offered year round. Courses in astronomy, geology, earth science, weather, and ornithology run throughout the year, and specialists give workshops on sheep-shearing, weav-

ing, flower-arranging, and natural dyeing. There are cross-country skiing trips and workshops on making snowshoes which the participants use for field trips. "Owl Prowls" are held throughout February, when owls are mating and nesting, and maple-sugaring is a popular spring workshop which draws an average crowd of 200 people.

What makes the center unique is the staff's emphasis on keeping many of the programs as natural as possible. "Simplicity can be a lot of fun," says Ferguson, and this attitude runs through many of the activities. For the summer programs, Ferguson tries to limit the expenditures to 50 cents a day per child. Using natural materials to make things themselves, he says, "means a lot more to the kids than being handed a ready made product. There's a lot of prep work for us because it's not your canned crafts — it's your real country life."

The center's most successful courses for children are those on the ecology of ponds or meadows, in which the participants are given nets for collecting small marine life and insects. "They find that it's a lot of fun when they get involved," says Ferguson. Discovery walks are also popular, and the staff finds that adding a special angle increases the interest. "It's boring for kids always to have strict field trips," says Ferguson, "but if you have them



looking for flowers with which they'll dye, they find it very interesting."

Tippett agrees with this philosophy of combining education and fun. In charge of planning games for the summer programs, she finds that environmental games -- charades using animal and plant names and woodland scavenger hunts -- hold a lot of interest for the children. "If you have a game in which you make them look off the trail or under things, it gives them a whole different outlook on the environment. They're learning and they don't even know it, because they're having fun at the same time."

The property on which the center is located was originally a large sheep farm with a small winery and an apple orchard. A small farm, with crops and some farm animals, still operates behind the center's main building. The variety of natural resources on the 140 acres to which the center has access are abundant: meadows, marshes, rivers, ponds, coniferous and deciduous forest, as well as the eastern side of the 900 foot Mount Tom. Plots in a large community garden are composted and tilled and then rented to individuals for a small fee. The New Milford Youth Agency sponsors a program in which young children, working in the garden, plant vegetables for local senior citizens.

There is also a biodynamic French intensive garden, based on a concept from 18th century Englishman Allen Chadwick. For this type of garden, crops are planted on a thick, 24-inch layer of topsoil and manure. Aerating the soil creates plenty of room for the roots to grow, and the result is a much higher yield of crops than that of a regular garden. In theory, says Education Director Sharon Brown, a five by 20 foot plot of this type can feed one person for a whole year. Many visitors come to see the garden, planted with onions, carrots, bulbs, and potatoes, to get an idea of how to start their own.

The center does not take in many animals because of a lack of staff time for taking care of them. "It's too bad," says Ferguson, "because the animals would really draw interest." However, in the farm area behind the center are lambs, ducks, and goats which the staff uses in some of its programs. There are also

several snakes, and Ferguson finds that "you can teach more ecological concepts with two snakes than with any other animal." A discussion of snake adaptation for survival and their role in food chains, for example, is a good way to introduce ecology. "Kids either hate or love them. Through slide shows and getting them to hold the snakes, the kids learn that all snakes aren't bad." The center has a pet boa constrictor, friendly enough to be held, and Ferguson hopes to acquire more native snakes.

According to Tippett, "The center offers quite a bit to the community," with a variety of environmental education services. In addition to programs both at the center and in local schools, the center's staff and local organizations trade off on one another's talents. Several cooperative programs have been held with nearby Putnam Memorial State Park; for example, Putnam staff members come dressed like 17th century weavers to the center's workshops on weaving.

Ferguson has also given a New England folklore weather program at the Sharon Audubon Society. Using such sayings as "red sky at night, sailors' delight," Ferguson explains how these adages, which "actually can be fairly accurate," were based on observed fact. "It's a chance to learn about weather in a fun way," says Ferguson. "Everybody enjoys it. I pack them in, because people around here are real New Englanders and like to be involved in old time things." He also takes the weatherlore program to schools. "By introducing elements of weather through folklore, it really keeps the kids' attention," says Ferguson. He also has done two presentations on astronomy legends of native American Indians for the American Indian Archaeological Institute.

The staff also plans nature trails and does design work and consulting for schools and organizations. Under the auspices of the center, the Paul Winter Consort and folksinger Tom Rush have appeared at local high school fund raising events. "We fill a good niche in the community," says Ferguson, and proof of this came in a 1979 fall awards ceremony when the center was designated a National Environmental Study Area, indicating that it provides an excellent ongoing environmental education program for all ages.



Since the release of 22 wild trapped wild turkeys in Connecticut in 1975, the turkey population has done what 740 pen-raised turkeys released in the 1950s and 1960s could never do. It has established itself in the State, independent of human assistance, and has grown both in number and range. Now 1500 to 2000 turkeys exist in the State in an area no less than 800 square miles in size.

Now that turkeys are established in the State, what is next? Although our turkeys are expanding their range rapidly, there are barriers to expansion. Physical barriers and dispersal time make it necessary to return to our established population and capture and relocate a few these turkeys to other parts of the State.

A device called a cannon net is used for this time consuming task. Turkeys are baited into an open area where the 40 by 45 foot net, packed into a wooden box, has been hidden. Once the turkeys become accustomed to feeding at this site, biologists attach three small rockets to the net and conceal themselves in a blind. Each of the rockets contains a explosive charge. When the biologists are fortunate enough to have the turkeys come to the site while the biologists are present and conditions are right, the net is shot over them by use of an electronic detonating device. Turkeys are very quick, and although it only takes a second or two for the net to fall over the birds, half of them usually escape. A second shot at the same flock of turkeys is rare.

After turkeys are caught, what is done with them? After capture, turkeys are removed from the net and placed in specially designed crates. The birds are then weighed, measured, aged, tagged, banded, and replaced in the crates. Some of the hens are radio tagged. A small transmitter is attached to the turkey so biologists can locate the bird in the future. The transmitters allow biologists to collect information which could be collected by no other method. Nest sites, egg counts, the success of nests, the location of hens with young, the survival of young birds, the range of the birds, and occasionally the location of a dead bird can be determined by use of radio tags. After processing, the birds are transported to a release site and freed.

How do we decide where the turkeys will be released? Release sites are chosen for their strategic locations in terms of physical and



Wild turkeys keep multiplying... gobbler season slated for spring

By Steven N. Jackson, Turkey
Program Biologist

time barriers and for the quality of the site for turkeys. We look for an area in large ownerships with few human inhabitants and with the proper food and cover for turkeys. Turkeys need a hardwood forest, preferably with quite a bit of oak, grassy openings secluded in the woods, and winter foods like Japanese barberry and sensitive fern. As long as these items are present in the area, the exact release location is not important. Turkeys are great walkers, often taking daily hikes of over 10 miles.

How close together are the release sites? It does not appear that a large number of release sites is necessary. Sites 20 to 30 miles apart are not unreasonable. Five years after the original release, 600 square miles were established. Five years from any successful release in the right areas, turkeys can usually close 15 to 20 mile gaps.

Assuming all goes well with the relocation work, how soon can we expect to have turkeys throughout the State? All areas of this state are not suitable for turkeys. Where human populations are high, turkeys will find it difficult. Feeding tames



Leonard Lee Rue III photos

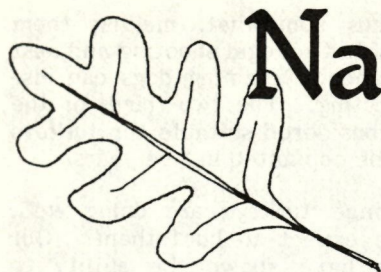
the birds somewhat, making them vulnerable to illegal shooting and nest disturbance. Roaming dogs can disturb nesting. The two-thirds of the state considered suitable for turkeys should be populated in five years.

Since turkeys are doing well, can we expect to hunt them? Our turkeys have shown the ability to double their numbers each year. This high level of productivity will level off once the density of turkeys starts to build up. Turkeys have shown by this rate of reproduction that the population could support a reasonable amount of loss. Limited hunting of turkeys could do more good than harm to the cause of establishing turkeys statewide. Limited hunting can keep the population wild, disperse the birds into new areas, and further public awareness of the turkeys and the laws to protect their future.

In addition to benefits to the turkeys there is the recreational benefit to the public. Success rates in turkey hunting are very low. Many hours of hunting are provided for each turkey killed. A spring gobbler season is the most logical form of hunting and offers a high quality additional recreation opportunity for the State's sportsmen, with virtually no impact on the turkey population and its growth.

What can hunters expect for the future? A spring gobbler season has been set for May 9 through May 23, 1981. Field guides and applications will be available in January 1981. Permits for both State and private land in a limited section of the State will be issued by lottery selection. A total of 1000 regular permits will be issued on five State land areas and five private land zones. Hunting will be from one-half hour before sunrise until 12:00 noon, using bow and arrow or shotgun. In addition to the 1000 regular permits available an undetermined number of permits will be issued to qualified landowners wishing to hunt only on their own land. Details and regulations will necessitate hunters' obtaining a field guide.

Where can I get additional information on the DEP Wildlife Unit's turkey program? A new publication called "The Connecticut Wild Turkey Program," is available. Copies may be obtained by writing the Department of Environmental Protection, Wildlife Unit, State Office Building, Hartford, CT 06115; or by calling 566-4683 or 379-0771. ■



Nature Notes

by Penni Sharp

Forests: the understory

The forest of Connecticut can generally be grouped under the broad heading central hardwoods, which describes one of the forest regions occurring in North America. Forest regions are determined by climatic and latitudinal differences. The Central Hardwood Forest Region is characterized by relatively abundant and evenly distributed rainfall and moderate but seasonally changeable temperatures.

The forests of this region tend to have well developed herb and shrub layers. In fact, the vegetation in Connecticut's deciduous forests is often stratified into four distinct layers: herb, shrub, understory tree, and canopy tree.

The canopy layer is readily observed. The tall trees give the forest its distinctive character. Their bright autumn colors can be seen from a distance. During summer the spreading canopy casts shade on the other layers and screens out noise, making the forests a cool and quiet place to visit.

The herb layer is also noticeable to the forest visitor. In the spring, it is dotted with delicate wildflowers, while during summer and fall ferns and mosses dominate this stratum. The shrub layer, particularly if it is dense and one is attempting to walk through it, is an obvious feature.

The understory layer, comprising trees whose maximum height is usually less than forty feet, is perhaps the most overlooked layer of the forest. Its trees lack the grandeur of the canopy trees. For the most part, understory trees are of little or no commercial value, yet some of our most interesting tree species are found in this layer of the forest.

Understory trees are shade tolerant and can carry on maximum photosynthesis at less than full sunlight. They are an important component of the forest as their presence increases its total diversity, enhancing healthy, disease-resistant development. A well-stratified forest is attractive to wildlife. Bird species' diversity increases if there are a variety of niches available. Warblers, for instance, have preferred feeding zones, and if a particular forest layer is not present the birds that it supports will be absent.

Some insects and small arboreal mammals also demonstrate a preference for certain layers of the forest. Forests that have a diversity of structure will generally attract a large diversity of animals.

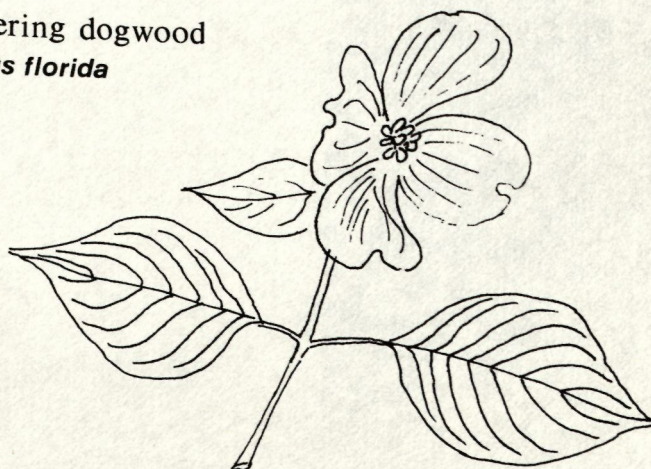
In Connecticut forests, the understory layer is composed of both saplings of the major tree species which are on their way to reaching canopy size and of several tree species that live out their entire lives at this level. Some of these permanent residents of the forest understory to look for are flowering dogwood, witch hazel, ironwood, and hop hornbeam.

Flowering dogwood is a common understory species in Connecticut woodlands. Dogwoods are one of the few tree species that have opposite branching leaves. The leaves, which turn purplish red in the fall, are ovoid and have distinctive secondary veins which parallel the smooth leaf margin. This pattern of venation is termed acuate and is diagnostic of all dogwoods. The four-parted flowers are quite small and inconspicuous, and the showy petal-like parts are actually bracts or modified leaves. From late August to November the red fruits, technically drupes, are borne in terminal clusters. Many species of birds and mammals feed on the dogwood fruits, thus the tree has important wildlife value.

During winter when leaves are off the trees, flowering dogwood can be recognized by its medium gray, finely checkered bark which has been likened to alligator skin.

Flowering dogwood has a variety of uses, both past and present. The wood is hard and dense, thus it makes excellent firewood as it burns hot. This hard wood has been used in the manufacture of bobbins, golf club heads, and tool handles. The bitter inner bark was formerly used as a substitute for quinine. Apparently the bark and twigs are quite effective as teeth whiteners and can be ground into a tooth powder. Those interested in natural dyes might wish to try the bark of dogwood roots which was used by the Indians to produce a red dye.

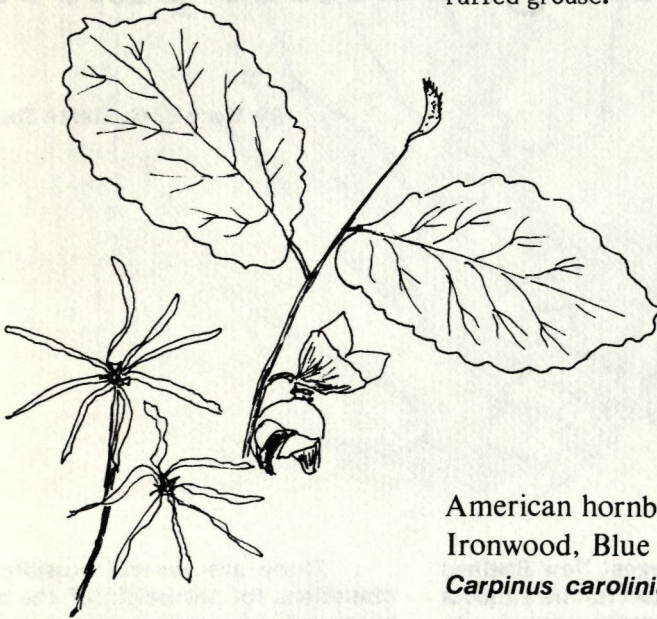
Flowering dogwood
Cornus florida



Dogwood grows well in the forest shade, needing only one-third full sunlight to perform maximum photosynthesis. It is relatively resistant to disease but can be quite susceptible to drought. During dry periods its leaves turn red and curl at the edges. Dogwood litter enriches the forest soil. Its leaves are high in calcium and decompose rapidly, releasing important minerals.

Witch hazel

Hamamelis virginiana



This interesting shrub or small tree can be found throughout rich, moist Connecticut woods. The oval leaves of witch hazel are alternate and are two to five inches long. They have a wavy margin and an uneven or lopsided base.

Witch hazel flowers appear in late fall or winter and are distinguished by four narrow yellow petals. From the flower, a two-beaked fruit capsule develops. When mature, the capsule splits open and forcibly expels the shiny black seeds. This disperses seed some distance from the parent plant.

The fact that witch hazel blooms when all other deciduous trees appear dormant apparently led the Indians to ascribe healing powers to this tree, and from the inner bark they fashioned a poultice for medicinal use. A witch hazel lotion distilled

from leaves and bark is in use today, and a major manufacturer of the extract is located in Essex, Connecticut.

Another interesting use of witch hazel is by "water diviners." It is one of the trees selected for cutting the forked sticks with which diviners attempt to locate underground springs.

Witch hazel twigs, buds, and seeds are utilized as food by wildlife species such as whitetailed deer, cottontail rabbit, pheasant, and ruffed grouse.

American hornbeam, Ironwood, Blue beech *Carpinus caroliniana*



The distinctive characteristic of this understory tree is the rippled, sinewy bark. This gives the tree a muscular appearance and accounts for another of its common names, "musclewood."

The sharp-tipped oblong leaves are doubly toothed. The leaf veins are straight and terminate in the larger teeth. The flowers are borne in spikes or catkins, and male and female occur separately on the same tree.

The fruit of this tree is a small nut which occurs at the base of a three pointed leafy bract. Clusters of the bracts bearing ripe fruits hang from the tree from August until November.

The wood of American hornbeam is dense and heavy. It decays rapidly when left on the ground. It was apparently a source of charcoal in the manufacture of gunpowder, and the wood has also been used for making tool handles. The fruits and buds are enjoyed by a variety of wildlife species including grouse, pheasant, wild turkeys, and gray squirrels.

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Connecticut's Pequots and the settlement of "the goodliest places"

By Mary E. Guillette Soulsby

The following short history of Connecticut's Mashantucket Pequots is an excerpt from "American Indians in Connecticut: Past to Present," a report prepared for the Connecticut Indian Affairs Council. The full report, which focuses on Connecticut's five extant Indian tribes (the Mashantucket Pequots, the Paucatuck Pequots, the Golden Hill Paugussetts, the Schaghticoke, and the Mohegans), is available in most of Connecticut's municipal libraries.

Author Mary Guillette Soulsby received her M. A. in anthropology from the University of Connecticut where she is currently a student in a Ph.D. program.

For the sake of space we have omitted the numerous footnotes and the extensive bibliography included in the original report.

At the beginning of the English settlement of what is now Connecticut, the Pequot tribe was the largest and most powerful tribe in the area, claiming jurisdiction over many square miles of territory. Though

smaller than the largest New England tribe, the Narragansetts, the Pequots were possibly the strongest and certainly one of the most aggressive tribes in New England. Most accounts estimate the Pequots' population at 3,000 to 4,000, including 600 to 700 warriors and 26 subsachems.¹

According to a tradition among the Pequots, the tribe had not been in this area long before the English came but had migrated to Connecticut from the New York area shortly before 1600. In New York the Pequots are said to have lived on the banks of the Hudson River south of what is now Albany and were called by their original tribal name, the Mahicans, which corrupted to Mohegans. For reasons unclear today a group of these Mohegans left their ancestral home on the Hudson around the turn of the 17th century and migrated to Connecticut, becoming known as Pequots.

1. Sachems were the Indian tribes' recognized leaders. They have been described as absolute monarchs but not despots.

There are several possible explanations for the origin of the name "Pequot." According to one source the defecting band itself adopted the name in honor of their Sachem Tamaquashad, who was sometimes called Pekoath or Pequot. A second source states that the tribal name came from the nickname of the Chief of the band, but from Wopigwooit (Wop-pequoit), Sachem of the Pequots just prior to English settlement in Connecticut. According to another, the name "Pequot", is an Algonkian word for "destroyer." It could be that the tribe named itself Pequot because of the meaning of the word or was given that name by other Algonkian tribes for the aggressive manner of the Pequot migration into Connecticut.

According to the tradition, the Pequots reached their seat in coastal southeastern Connecticut by pushing through the tribes in their way, conquering and exacting tribute from them, and driving some of them away. According to an early source, they "came down from out of the inland parts of the continent, and by



force seized upon the goodliest places near the sea and became a terror to all the neighbors." They are said to have split the local Niantic tribe of the southeastern coast into two tribes, the Eastern and Western Niantic, forcing some of them into Rhode Island to mix with the Narragansetts. They finally settled along the Pequot River (now called the Thames), along the Mistick River and along the adjacent coast of what is now New London county, from the Niantic River to the Rhode Island line.

The Pequots then began to branch out to subdue the smaller tribes around them. They conquered the Podunks, Tunxis, and all of the River Tribes. Eastward, they conquered the entire area from the Connecticut River to Rhode Island, including up to the Nipmucks of Windham county. Along the coast to the west they overpowered all the tribes as far as New Haven Bay. They forced tribute from the natives of part of Long Island and from the Block Island Indians. The Pequots

also extended into the western part of Rhode Island as far as the Wecapaug River (about 10 miles into Rhode Island) until they were driven out by the Narragansetts in 1635, just prior to English settlement in Pequot country. The fact that the Narragansetts were the only area tribe to successfully stand up to the Pequots, combined with the proximity of the two groups to each other, no doubt accounts at least in part for the long-standing enmity between the two tribes found to exist when the English first arrived. The Narragansetts and Pequots waged continual conflict.

The Pequot country proper was mainly within the territory now covered by the towns of New London, Waterford, Groton, Ledyard, Stonington, and North Stonington; that is, from the Niantic River on the west to the Paucatuck River on the east, and from Long Island Sound some 12 miles into the interior of Connecticut. The tract was approximately 30 miles square, but did not include the wide area conquered by the tribe as described above.

Wopigwooit was Sachem until 1631 or 1632 when he was killed by the Dutch. His main residence was in a fort on Pequot Hill in Groton, near the Mystick River (the fort later attacked by the English in the Pequot War). Wopigwooit's son and successor, Sassacus, was sagamore at New London (then called Pequot) and had a fort on a tract called Fort Hill near the banks of the Thames by Noank, a few miles to the west of Wopigwooit's fort. Both forts were actually fortified villages—clusters of homes surrounded by fences of logs, stakes and interwoven trees. When the English commenced settlement, Sassacus had become Sachem and was ruling from his main residence, the fort near the Thames, at a place called Weinshauks.

White settlement of Connecticut and early Pequot-European relations

In 1614 Adrian Block and a small company of men representing

the Dutch sailed up the Connecticut River. The first whites known to have explored the river, they named it "Fresh Water" or the "Fresh River." Their descriptions of their journey provide the first mention of the Pequots. The Dutch quickly established a trading relationship with the native people and from 1614 to about 1632 traded with Connecticut Indians up and down the Connecticut River and along the coast but made no settlements. They were apparently interested in commerce only and had no real competition as yet.

In the meantime, the English had established separate colonies at Plymouth and Massachusetts Bay but had yet to venture into Connecticut. However, both these colonies had been approached in 1631 by representatives of some of the smaller and weaker Connecticut tribes, who gave glowing reports of the settlement and trade potential of the Connecticut River

Survivors of the Pequot War were sold as slaves, kept as servants, divided among allies of English

Valley and encouraged the English to settle there. The reason behind the solicitation soon became apparent to the English; these tribes were under the thumb of both the Pequots and the Mohawks, who were forcing tribute from them. They hoped that English settlement in the valley would help defend them against the stronger tribes. The Dutch had been asked first but had declined, unwilling to make a permanent settlement in the area. Massachusetts Bay, the larger colony, also declined the offer, put off by the dense Connecticut forest and rumors about the potentially hostile Pequot tribe.

Plymouth Colony accepted the offer. In 1632 it sent Edward Winslow to explore the lower Connecticut River for fur trading and

colonization possibilities. Winslow returned home with a favorable report, and Plymouth began to make plans for a settlement there.

The Dutch, however, heard of the plans of the Plymouth colony and took immediate action to prevent English competition in an area that they considered theirs by right of discovery. In June of 1633 the Dutch built a trading house at Sukiog, the future site of Hartford, erected on land they had purchased from Wopigwooit, Sachem of the Pequots, who had only recently subdued the local Indians. They named it the House of Good Hope and invited all Indians to share in peaceful trade there, the post serving as neutral ground. This way the steady flow of furs would not be impeded by outbursts of hostility between enemy tribes.

The Plymouth Colony protested the Dutch settlement as conflicting with English rights, claiming the territory for England by right of discovery (by virtue of earlier trips to America) and for themselves by an earlier grant from the Crown. In September of 1633, Plymouth sent another expedition, under William Holmes. Holmes was sent with a prefabricated trading house and orders to set up a trading post in the general area of the Dutch. This he accomplished despite Dutch threats, setting up the trading house eight or nine miles upriver past the Dutch site near the junction of the Connecticut and Farmington (then Tunxis) Rivers, in what is now Windsor. The English fortified the post for protection against Indians and the Dutch and to help them control the waterway. The Plymouth trading fort was built on land which Holmes bought from the leader of the original tribe in the vicinity, either not realizing or ignoring the fact that this tribe had been recently conquered by the Pequots.

Also in September of 1633 John Oldham and three others from Dorchester, part of the Massachusetts Bay Colony, traveled by land to Connecticut, exploring and trading along the Connecticut River. The following year, he returned by water with eight or nine men and remained at Pyquag (now Wethersfield) where he made his headquarters for trade.

While Indians and whites alike in New England feared the Pequots, early Pequot-European relations were

relatively peaceful. The Dutch traded with the Pequots and other Connecticut tribes before the English began settlement in the area and acknowledged the dominance of the Pequots over the smaller River Tribes by purchasing land from Wopigwooit, the Pequot Sachem, on which to build their trading fort. The English, in their haste to challenge the Dutch and set up a post and in their unfamiliarity with the area, failed to do so and inadvertently insulted the Pequots by dealing with one of the River Tribes instead. Despite this potentially dangerous blunder on the part of the English, English fears of problems with the Pequots did not materialize. In fact, the English relaxed somewhat when the Pequots did not take any action against them and began to see the tribe in a more favorable light. This is shown in William Wood's 1634 description of the Pequots as a "stately warlike people . . . just and equal in their dealings; not treacherous either to their country-men, or English."

More and more of the English colonists soon began to arrive in Connecticut. The Bay Colony was becoming crowded and farming land scarce. Many of its members were restless and anxious to move out, encouraged by the favorable reports about Connecticut's resources and by the Pequots' peacefulness. In the next year, 1635, Massachusetts Bay colonists migrated to Connecticut and joined Oldham's settlement at Wethersfield in addition to settling at Hartford and Windsor. Both the Plymouth people and the Dutch in Connecticut resented what they considered an intrusion by Bay colonists but could do nothing about it because they were both weaker than Massachusetts Bay. Massachusetts Bay settlers gradually forced the Plymouth colonists out of Windsor, ignoring the latter's English title to the land and their purchase of it from the local Indians.

The Dutch bought land at the mouth of the Connecticut River from the Pequots, planning to build a fort there and thus obtain control of the Connecticut River and Valley. However, the English beat them to it by erecting a fort at Saybrook, effectively shutting the Dutch out of the river. The Saybrook settlement of 1635 was set up independently of the other English colonies, through John Winthrop, Jr., from England.

Through all these moves, the English had been relatively careful not to offend the Pequots and risk ending the important peace that would allow continued English expansion. However, soon after English settlement intensified, relations between the Dutch and Pequots deteriorated, followed by troubles between the English colonists and the Pequots. In 1637 these escalated into a war that brought a bloody end to Pequot power in the region.

Pequot War

This important and tragic event deserves much more attention than can be provided in this report but the following brief description provides a basic outline of the actual war without delving into its causes.

In 1636, trade-related war broke out between the Pequots and the Dutch. Soon after, for reasons too complex to go into in this report, relations between the English colonists and Pequots became strained and broke into a series of skirmishes, initiated by both sides. After a year of intermittent attacks and escalating tension, war was officially begun. On May 10, 1637, the Connecticut colonists officially began an offensive war against the Pequots. The colony assembled an army of 90 soldiers and was joined by a group of 70 Mohegans and their Sachem Uncas, who offered Mohegans and their services to the English. The Mohegans were a group of Pequots who had recently split off from the Pequot tribe and formed their own tribe and were anxious to help destroy their former tribe.

Since the Pequots, occupying two forts near the coast (one on the Thames and one on the Mistick River), expected an attack from the water, Captain John Mason, leader of the combined army, developed an alternative plan. The group of 160 men journeyed by land and by the Connecticut River to the English fort at Saybrook, in the heart of Pequot country, from whence they sailed together past the Pequot fort at Pequot harbor to give the impression that they had changed their minds about attacking the tribe, now led by Sassacus, successor to Wopigooit. The army continued on to Narragansett country, where they requested

permission of the Sachem Miantonomo to cross his country unhindered back into Connecticut in order to launch a surprise attack on the unsuspecting Pequots.

The Narragansetts were only too willing to help defeat the Pequots, their traditional enemies, although they were awed at Mason's plans to attack the tribe that was dreaded by the Indians throughout Connecticut and the surrounding areas. Miantonomo granted free passage through Narragansett territory, and many of his tribal members volunteered to join the expedition. Along the way to Pequot territory, the expedition was joined by a number of Eastern Niantics, who were tributaries of the Narragansetts.

On May 26 the group, now including several hundred Indians, reached the Pequot country, at which time Mason decided to attack the fort nearest to them, the Mistick River fort. From the accounts of the war, it appears that most of the Narragansetts and Niantics lagged farther and farther behind as they neared the fort, but Uncas and his men stayed with the English.

The army surprised the fort with a ferocious attack at daybreak and then burned it. Between 300 and 700 Pequot men, women, and children were killed, few of the inhabitants escaping. By chance, more than the usual number of Pequots happened to be in the Mistick fort that day, celebrating what they thought was the decision of the English not to attack them. On the side of the English and their Indian allies two were killed and 20 wounded.

The Pequots were nearly destroyed by the vicious attack. Sassacus, who had been in the Thames fort at the time, and the remaining Pequots from this fort deserted the post and fled westward, as did the relatively few Pequots who had managed to escape the Mistick fort attack. Connecticut, now joined by forces from Massachusetts Bay Colony and Plymouth Colony, launched an effort to hunt down the Pequot survivors who had scattered all over Connecticut, seeking refuge from the English. The Mohegans, still anxious for revenge against Sassacus, actively took part in the pursuit, as did Connecticut tribes who were eager to

help destroy their former conquerors. But Sassacus ultimately eluded them only to be killed by the Mohawks, to whom he fled looking for sanctuary.

Fate of Pequot survivors determined

In the Pequot War hundreds of Pequots were killed and many were captured. Those who escaped were dispersed all over, some taken in by neighboring tribes such as the Nipmucks and the Long Island Indians, others finding homes in tribes as far south as North Carolina. A group of survivors remained in their former territory in New London county and made a formal submission to the English in exchange for their lives. Those Pequot survivors held by the English—the captives as well as the group that voluntarily surrendered—were disposed of in several ways. Some were sold as slaves to the West Indies, while others were kept by Englishmen as servants. The great majority, however, were handled under terms of a tripartite treaty made immediately after the war, a document which also set up guidelines for the future treatment of the Pequots.

The Tripartite Treaty

On September 21, 1637, Uncas, representing the Mohegans, and Miantonomo, representing the Narragansetts, met with the Connecticut authorities at Hartford to decide the fate of the Pequot remnant in English hands: some 200 men, women, and children. A treaty was made between the three parties. By its terms there was to be perpetual peace between the Narragansetts and the Mohegans who had been enemies from the inception of Uncas' tribe. However, if any quarrel between the two should occur, the injured party was to appeal to the Connecticut authorities who would decide between them, the decision to be binding (that is, should either tribe refuse to abide by the decision of the Connecticut authorities, the English could compel submission). The Pequot survivors were forbidden ever to reorganize and live together as a tribe, lest they threaten English settlement again.

The 200 Pequots were then divided among the tribes which had

aided the English in the war, in proportion to the amount of aid each had furnished. Approximately 100 were appointed to Uncas, 80 to Miantonomo, and 20 were placed with Ninigret, Sachem of the Eastern Niantics (then a tributary of the Narragansetts). This arrangement was ostensibly for the protection of these Pequots but was actually more of a method of rewarding the Indian allies of the English for their services in the 1637 war. An annual tribute was to be collected by each of the three chiefs from his Pequot "wards," to keep them submissive. Henceforth they were not to be recognized as Pequots, while their former territory was to be considered the property of the Connecticut English by right of conquest.

The Pequots regroup

As they had expected, the Pequots received poor treatment from the Sachems they were placed under and soon appealed to the English for a redress of their grievances, which the English denied them. They asked, unsuccessfully, that a place be assigned them to live on. The English repeatedly refused to become involved. Many Pequots, unable to tolerate their maltreatment, began leaving their assigned tribes and gathering together in defiance of the treaty orders. Within a year or two after the signing of the treaty, a large group of Pequot deserters gathered together and formed a village on the banks of the Paucatuck River, in a part of their old territory.

The Connecticut authorities, annoyed at the flagrant violation of the treaty orders by the Pequots, determined to show the Pequots that they meant business and the Mohegans and Narragansetts (and tributaries) that they would enforce the treaty. Captain Mason was sent with 40 men to drive off the group, and was joined by Uncas and approximately 100 Mohegans. Upon arriving near the village on the Paucatuck River Mason encountered several Pequots, informed them of his mission, and advised them to convince the rest of the group to leave peacefully. When the messengers failed to return immediately with a response, Mason took the village by surprise, driving off the inhabitants destroying their village, and taking

their corn, wampum, and other valuables.

The Pequots become divided into two bands

Soon the Pequot deserters began to gather again in their old territory, joined steadily by recent deserters from the English and the Mohegans and Narragansetts. In doing so, they became generally divided into two bands—one living near the Paucatuck River in the town of Stonington, close to Narragansett territory, and one living near the Thames River in what was by then New London. Efforts to return the Pequots to the Mohegans and Narragansetts failed, and the colonists eventually accepted the existence of two Pequot groups. After repeated requests from the two bands, the English in 1655 finally decided to give some land to each of the two groups. The group on the Paucatuck River received land in the immediate area and was designated as the Paucatuck or Eastern Pequots. The band located near the Thames was given land on the Mistick (Mystic) River in Noank. There it came to be known as the Mashantucket or Western Pequot tribe, the tribe which we are concerned with in this report.

Each group was placed under the direction of an Indian governor, appointed from the members by the English. Each governor (or Sachem, as it turned out) was to rule his own group according to a specific code of laws drawn up for the Pequots by the English, in 1674, at the request of the Indians. These laws included prohibitions against such crimes as drunkenness, murder, adultery, and "Sabbath-profaning." Robin Cassassinamon, leader of the Western Pequot band, was formally made governor over this group, the larger of the two. Hermon Garrett (also known as Cashawashet and sometimes as Wequash Cook) was appointed to head the Eastern or Paucatuck Pequots, as they became known. Cassassinamon was ordered not to try to lure away those Pequots who were still with Uncas. However, many Pequots came to him from Uncas' group, without his soliciting them.

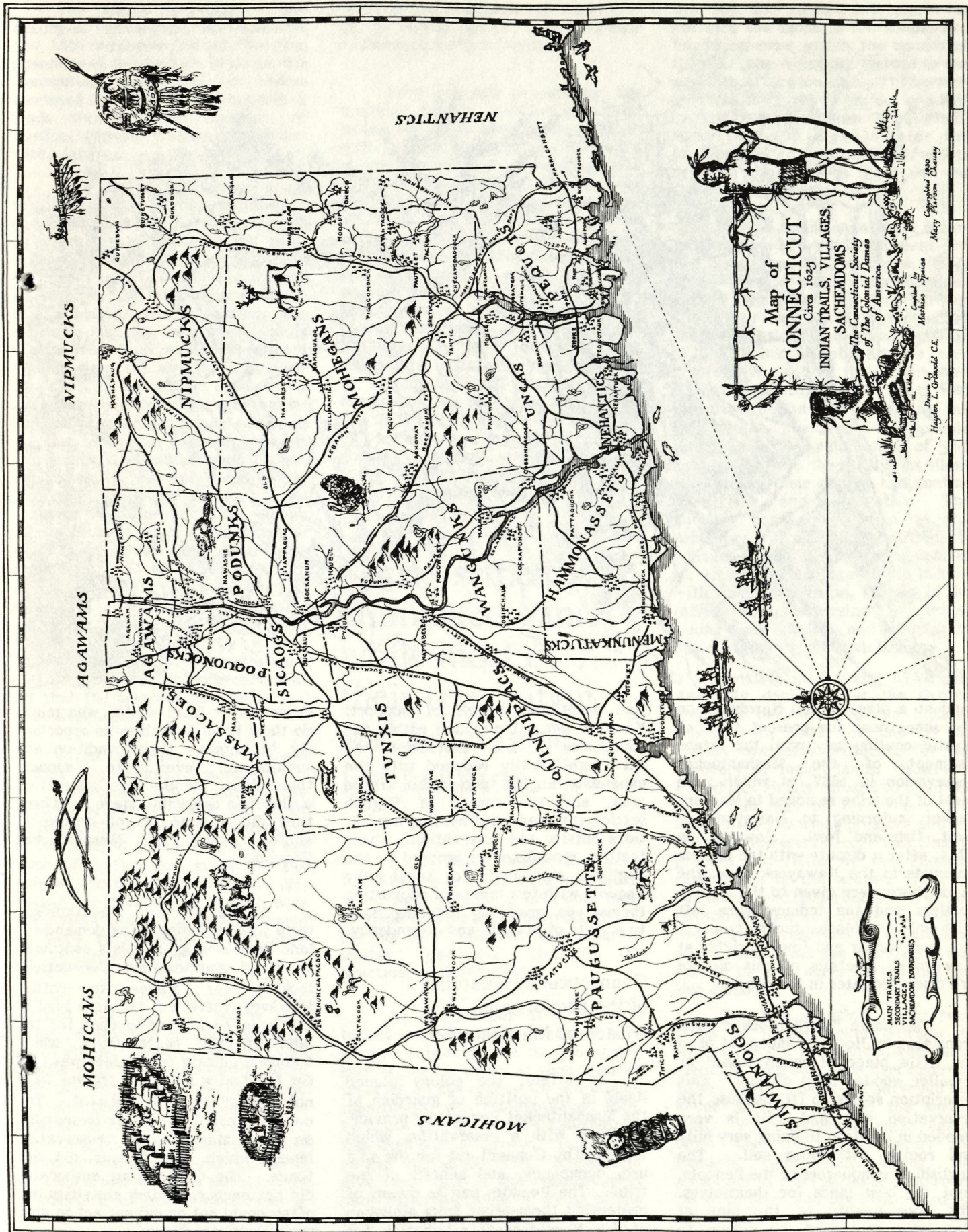
The Pequots, now in two tribes, thus became wards of the colony. Land was assigned to each group, but these were not reservations, although some of the early records imply this.

The two Pequot tribes were separate, virtually self-governing political entities and were treated as such, although they functioned according to a code of laws drawn up by the English and had little power. The colony served as a consultant and a source of appeal. Unfortunately, the Pequots were taken advantage of by neighboring whites, who were keenly aware of the Indians' lack of power, soon after their settlement in their communities in 1655. These whites allowed their livestock to roam into the cornfields of the Pequots and ruin their corn, in addition to disrupting their villages. As a result, the Indians' land did not produce enough for their needs, yet they could not enter, hunt, or fish on many of their old lands, which were now claimed by the English or by Uncas. For several years the two groups sent annual pleas to Connecticut authorities, asking for two other places for permanent settlement where they could build their wigwams and plant corn without disturbance; a place set aside for the sole use of each tribe. In 1658, Connecticut granted each group certain tracts in surrounding towns, but those towns that would have had to give up land refused to comply until several years later. In the meantime, in 1661 the English appointed white overseers to each group to help protect the Indians, to assist and advise the native rulers, and encourage the development of "civilization" and Christianity among them.

The establishment of reservations for the two Pequot tribes

Finally, after a struggle for several more years, the Western Pequots (Cassassinamon's band) had a reservation of 2000 acres set apart for them by Connecticut in 1667, which the Indians named Mashantucket. The reservation was located where it is today, in the northeast part of New London in what is now the town of Ledyard. The Paucatuck (or Eastern) Pequots, in 1683, were granted a reservation of 280 acres on the eastern side of Lantern Hill, in North Stonington, near the Mashantucket reservation. Overseers continued to advise and aid the native leaders of each tribe.

The Mashantucket Pequots occupied approximately 500 acres of





land at a place called Nawayonk on the shore near the present town of Mystic continuously until the establishment of the Mashantucket reservation in 1667, at which time most of the tribe removed to Mashantucket, returning to Nawayonk to hunt, fish and fowl. However, in 1714, after a dispute with the English colonists in the Nawayonk area, the lands there were given to the English settlers and the Indians were left with only the Mashantucket reservation and fishing and fowling rights at Nawayonk. Details of this dispute are discussed later in the paper.

The name "Mashantucket" was translated by Hodge to mean "at or in the little place of much wood" or "smaller wooded tract of land." This description seems to fit, because the reservation was and still is very wooded in addition to being very hilly and rocky, with poor soil. The English, as conquerors of the Pequots, kept the best lands for themselves. The poor quality of the land at Mashantucket forced the Indians to

find additional means of support. Yet, the amount of game within the boundaries of the reservation had been significantly reduced with the expanding English population in the area, and the spread of English settlement prevented hunting expeditions outside the reservation. These factors, unrealized or ignored by the English, combined to leave the Pequots with few means of supporting themselves, gradually reducing them to a state of poverty and dependency.

Connecticut as guardian of the Pequots and trustee of Mashantucket

In effect, the colony placed itself in the position of guardian of the Mashantucket Pequots by providing them with a reservation, which was held by Connecticut for the sole use, occupancy, and benefit of the tribe. The Pequots had no means of protecting themselves from Mohegan and/or Narragansett retribution for

desertion or from whites who might do them harm as well as no opportunity to improve their condition and sometimes even to support themselves. While the Connecticut authorities ostensibly made an effort, they did a poor job of protecting and/or aiding the Mashantucket Pequots.

Problems for Mashantucket were just beginning. The demand for land increased as colonists continued to flood southeastern Connecticut looking for places to settle. However, there was no more land in the area to be had—except for the land on the reservations, which colonists quickly determined was *not* for the taking since the Indians were not "using" it to its utmost. The colonists could not resist trespassing on the Mashantucket reservation lands, which the Indians did not fence. The Connecticut authorities did not encourage such activities but often could not or did not act to stop such illegal practices.

The Public Records of the Colony of Connecticut from the 17th and 18th centuries reveal that the guardians of the Western Pequots, the Connecticut authorities, in effect condoned the usurpation of the tribe's lands through their manner of handling disputes involving the reservation land.

Typically, an Englishman would settle on a piece of reservation land and fence off a lot, claiming it as his on a variety of grounds, the most common ground being that the Indians were not "using" all the land so they did not need it all. The Pequots, having neither the power nor the means to oust the trespassers, would then petition the Connecticut authorities to right the wrong. Connecticut, stuck in the middle between its Indian wards and land-hungry colonists, would avoid making a decision in the case as long as possible, appointing committee after committee, sometimes for several years (while encroachments were occurring constantly). In the end, the colony usually chose to avoid a confrontation with the colonists and upheld the English claims. This was often accomplished by a reexamination and survey of the reservation lands, ostensibly to determine if encroachments had been made by whites. Their surveys nearly always revealed that there had been no encroachment but that the previous boundaries had been inaccurate.

Often the cases of the Pequots against the English encroachment went undecided. The Pequots, as the petitioners, had to bear the court costs, and the long delays on the part of the General Court were often too much of a financial strain on the Indians, who had to let the issue die, leaving the whites free to take over reservation land. The Pequots could not hope to prosecute all or even most of the trespassers.

By handling Mashantucket land disputes this way the colony was trying, consciously or unconsciously, to maintain middle ground and thereby maintain good relations with both the Pequots and the colonists. To accomplish this, they appeased the Pequots at least temporarily and their consciences permanently by taking action on the complaints of the Indians and satisfied the colonists by managing to decide most cases in their favor. The action by the colony set a precedent—the colonists quickly

realized the reluctance of Connecticut to decide against them and this encouraged further trespassing.

Land disputes account for the majority of the Mashantucket land losses, but there were other means as well. Some Pequots privately sold and/or leased land parcels to white settlers although they did not have the right to (because the Indians did not hold the land in fee simple; rather, the land was reserved to them by the colony for their exclusive use and occupancy). Leasing the lands was not only illegal, it was dangerous because the white lessees often later claimed the lands as their own and would not pay rent. According to one source, the private selling and leasing of reservation land continued until the town clerk of Groton was forbidden in 1731 to record any transaction by which any Indian transferred possession of land and the Assembly forbade any surveys or fences to be made in Mashantucket.

Dense settlement eliminated game while most of their reservation was unsuitable for farming

In any case, through the years, the Western Pequots were unsuccessful in their efforts to hold onto most of their reservation land. Bit by bit, parcels of it fell into the hands of whites, generally through the practices outlined above.

As of October 1732 Mashantucket was found to measure 1737 acres. However, the Groton people had begun to exert a good deal of pressure on the colony for more land, specifically the Mashantucket land. Ledyard, the site of the reservation, was then part of Groton. The townspeople demanded that Connecticut give them half of the Mashantucket lands, claiming them by virtue of the fact that the Indians were not making the best use of them and only needed

one half, and because the Indians did not own the lands in fee simple and the lands were within the bounds of Groton. The Assembly yielded to the demands of Groton and in 1732 granted them the right to lay out one half of the reserved lands of Mashantucket into 50 acre lots for the townspeople to lease. The Pequots retained the right to plant and cut firewood on these lands.

Half of the Mashantucket reservation soon proved insufficient for the Groton people, however, as in May of 1747 the Pequots complained to the Assembly that the Groton people had fenced in a greater part of the reservation than given them in 1732 and had destroyed their corn planted there so that the Indians were prevented from using the lands. No effective action was taken by the government. The Groton townspeople interpreted the reluctance of the colony to act in the matter as silent approval of their actions and continued their encroachments. The Pequots complained again to the Assembly. From their petition, it appears that the neighboring whites were taking advantage of the Indians with reckless abandon, fencing in the Indians' land, destroying their crops, taking their timber, and refusing to pay rent, among other violations.

Finally, in October 1752, the Assembly decided that the Groton colonists had wronged the Indians, repealed the 1732 Act, and let the Pequot overseers prosecute for the recovery of Indian lands. However, the whites simply refused to yield the lands. In May of 1761 the colony again bowed to white pressure and redivided the reservation. This time it granted two-fifths of the Pequots' reservation to the whites. That is, 656 acres and 100 rods went to the Groton people, and 989 acres and 68 rods were re-reserved for the Indians, which means that the reservation had shrunk to 1647 acres by the time of this division.

The 1761 decision, giving two-fifths of Mashantucket outright to whites, should have ended encroachments but did not. The part reserved to the Pequots had been surveyed but never marked out, and the survey lost. Encroachments began again. More than ten years later, the Pequots were still asking the Assembly to erect suitable boundaries between them and the Groton people. After the Revolution, in 1785, a new survey was begun, completed in 1793.



Neighboring whites fenced Indians' lands, destroyed their crops, took timber, refused to pay rents

However, the townspeople objected to it because it left them with less land than they had received in the 1761 decision. Settlement of the issue was again postponed, and in the meantime, in 1790, the Indian Non-Intercourse Act was passed by the federal government. This act prohibited the sale of any and all Indian land without congressional approval.

The case was finally brought to a close in 1800, when the overseers of the Pequots were empowered by the Assembly to sell the disputed tracts to the white claimants if they would pay the prices as appraised. This worked for a while in favor of the Indians who retained possession of their lands since whites refused to pay for them.

From the records it appears that the Pequots managed to hang on to their 989+ acres at least until 1850, probably due at least in part to the 1790 federal act. However, in

the course of 15 years, the Pequots lost or sold approximately 89 acres, because in 1865 the reservation consisted of about 900 acres, the clearest portion of it leased to white tenants.

By 1901 the reservation had dwindled to approximately one-tenth the size it had originally been, approximately 200 acres, much of it having been sold off by the overseers with the permission of the state and the income from it used for the benefit of the Pequots and to pay their expenses, an illegal but common practice.

In 1963, the Mashantucket reservation was surveyed and determined to consist of 212.9 acres, its total today.

The Mashantucket reservation in the 18th and 19th Centuries

At the time of English settlement in Connecticut, the Pequots probably numbered between 3,000 and 4,000 persons. However, their defeat in the Pequot War left them with a substantially reduced and scattered population. When the Pequots were regrouped into two separate tribes in 1655 the combined total consisted of perhaps 200 individuals.

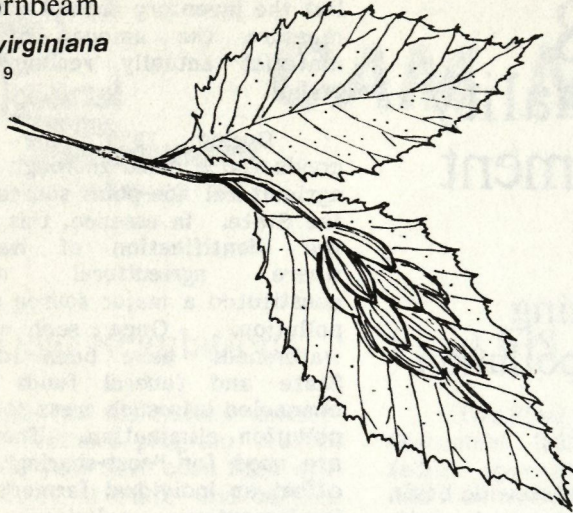
In 1786, a relatively large number of Pequots (from both tribes), some Mohegans, along with Indians from Connecticut, Rhode Island, and

Long Island, in response to an invitation by the Iroquois to settle on some of their unoccupied lands, removed to Oneida County, New York, and formed the nucleus of what has since been known as the Brothertown tribe. This move reduced the Mashantucket population considerably. In 1820 only 50 Indians were reported as belonging to the tribe, and by 1832 the number had fallen to around 40. In 1848, Colonel William Morgan, overseer of the tribe, gave their number as 28, of whom 20 lived in Ledyard on the reservation and eight in other places.

Contemporary accounts typically describe the Pequots in the 18th and 19th centuries as "lazy and improvident" because they were not industrious in the English sense. However, the opportunities available to the Pequots in terms of their skills and resources on the reservation were very limited. They were discouraged from engaging in their traditional means of subsistence (horticulture supplemented by hunting, fishing, and gathering) in several ways. One, most of the land was unsuitable for farming. Two, whites encroached on the lands the Indians managed to plant. Three, the dense white settlement in the area had eliminated an adequate game supply. The Indians were forced to adopt whatever other means of subsistence were available to them. These included the selling or renting of reservation lands, the cultivation of small garden plots, the planting of a small orchard, working for neighboring English for a few days at a time, and living with English families or sending their children to live in English homes. Some Indians kept a few animals, but adequate grazing land was scarce. Basket-making became a common source of revenue in the 1800s as did the manufacture of wooden bowls and utensils which the Pequots would sell in neighboring towns.

These activities did not amount to much income, and the tribe was poverty-stricken throughout these years in addition to being plagued by disease (including alcoholism) and frustration resulting from constant land battles with whites. As the years went by, more and more members found it necessary to leave the reservation to support themselves. Some moved to other communities, and many young men signed on for long whaling voyages out of New London.

Hop hornbeam
Ostrya virginiana
 From page 9



This tree belongs to the birch family as does American hornbeam. There has been much confusion over the common names of the two species, and both have been called ironwood. While similar in many respects to American hornbeam, hop hornbeam can be distinguished by its bark which is grayish brown and shreds in narrow strips.

The leaves closely resemble those of its relative and are oblong and pointed with a double-toothed margin. In texture, they are somewhat more hairy than those of American hornbeam. The flowers occur in catkins, with separate male

and female on each tree. The male catkins usually persist throughout winter. The fruit or nut is borne in a bladder-like sac. The clusters of these sacs are thought to resemble hops, hence hop hornbeam.

The wood of hop hornbeam is extremely tough and hard. It makes excellent firewood but is difficult to work with. The wood has been used for making bows, handles, and sled runners. European species were used for yoking oxen. Its fruit, buds, and twigs are a winter staple for grouse, pheasant, cottontail, and deer.

If you wish to identify trees in the understory layer, there are several good field guides and twig and leaf keys.

Field guides:

Brockman, C. Frank. Trees of North America. Golden Press, New York: 1968.

Petrides, George A. A field guide to trees and shrubs. Houghton Mifflin Co., Boston: 1972.

Key:

Muenschner, W. C. Keys to woody plants. Cornell University Press, Ithaca, N.Y.: 1950. ■

Way to go

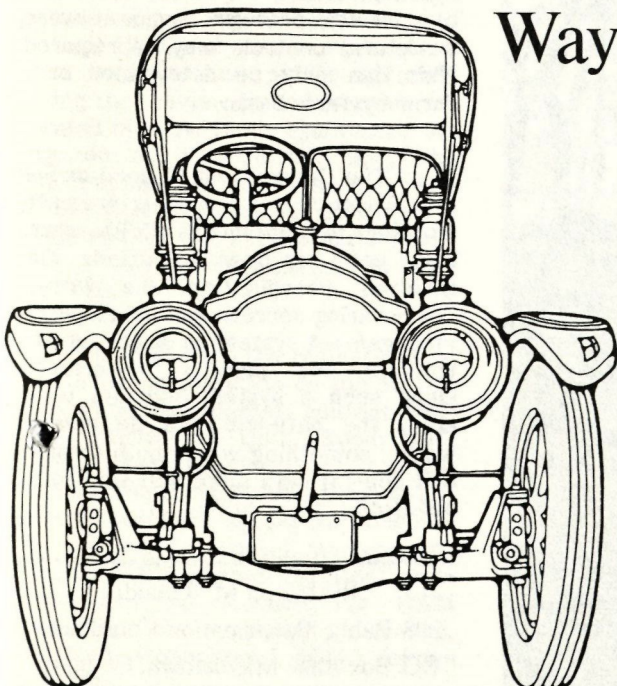
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The Connecticut 208 Program has been working to control non-point sources of water pollution since 1977. Non-point source pollution can be defined as pollution which does not originate from a pipe (point source). Common examples are erosion and sedimentation from construction sites, urban stormwater runoff, and leachate from landfills.

Agricultural activities can also cause non-point source pollution. A storm can wash tons of soil into nearby water bodies. In addition, the storm water can carry herbicides, pesticides, and fertilizers into the same lakes and streams. Manure piles can contribute nutrients to both surface and ground waters if not properly managed. Milk parlor wastes are capable of causing similar problems.

As a matter of fact, on a national basis, agricultural activities constitute the most widespread cause of non-point source pollution. Such activities affect over two-thirds of the nation's river basins and contribute more than half the total sediment reaching U.S. waterways.

In Connecticut, however, the picture is brighter. Agricultural lands make up roughly 15 percent of the State's land area. Consequently, agricultural operations are not the largest contributor of non-point

208 water quality management

Controlling agricultural pollution

source pollution on a statewide basis. But in some rural watersheds, agriculture is the principal source of such pollutants. Depending on the nature of the receiving water body, agricultural pollutants can have a lasting effect on water quality.

The Connecticut 208 Program has been involved in the development of a strategy designed to reduce agricultural pollutants in the State. In 1977 and 1978, the Connecticut Council on Soil and Water Conservation conducted an inventory of major sources of erosion and sedimentation on a statewide basis. A portion of the inventory dealt with agricultural sites. This provided an initial picture of some of the agricultural problems in terms of erosion.

But the inventory did not attempt to measure the amount of eroded material actually reaching water bodies.

During 1979, the Council conducted a more thorough study of agricultural non-point sources across the State. In essence, this involved the identification of watersheds where agricultural activities constituted a major source of water pollution. Once such "priority watersheds" have been identified, State and federal funds can be channeled into such areas to assist in pollution elimination. These funds are used for "cost-sharing" to help offset an individual farmer's cost of implementing pollution control programs.

At the present time these activities are voluntary. A farmer is under no obligation to undertake such an activity. But the DEP has the authority to require abatement of such pollution, if necessary.

For the most part, Best Management Practices (BMP's) are usually sufficient to control agricultural non-point source pollution. These can take the form of contour plowing, leaving buffer strips along waterways, planting winter cover crops to lessen erosion, and careful application of fertilizers and other chemicals. These are low cost-cost activities which don't require construction of expensive facilities.

If the problem is more severe, structural controls may be required. This can only be determined on a farm-by-farm basis.

The Connecticut Council on Soil and Water Conservation is presently working to implement BMP's where their need has been identified. This involves coordinating the various cost-sharing sources and developing a management system to direct funding towards the priority watersheds. Once such a system becomes operable, the outcome will be cleaner water, something which both farmers and non-farmers alike will find to be beneficial.

By Joseph M. Rinaldi,
208 Public Participation Coordinator,
P.O. Box 1088, Middletown, Ct. 06457



Jenny Mead photo

A 30 minute slide show entitled "Connecticut's Inland Wetlands" is now available through the Water Resources Unit of the Department of Environmental Protection. It will be available to conservation and inland wetland commissions and the general public. It is a brief introduction to the regulatory process as defined by the Inland Wetlands and Watercourses Act of 1972. It covers: the different types of wetlands and watercourses as defined in the Connecticut State Statutes; the important functions that wetlands perform for society when left in their natural state; the evaluation factors the Inland Wetlands Program considers when reviewing a permit application; and what precautions must be taken to prevent unnecessary disturbances to the wetlands. To borrow this slide show, call 566-7280 or 566-7281, or write Department of Environmental Protection, Water Resources Unit, Inland Wetlands Program, Room 201, State Office Building, Hartford, CT 06115. ■

New Tidal Regulations

Regulations for the State's decade-old tidal wetland program drafted earlier this year have been filed with the Secretary of State and became effective August 11, 1980. The regulations outline the criteria used to evaluate an application for a permit to conduct regulated activities in the State's tidal wetlands.

The new regulations were developed to guide permit applicants regarding "processing procedures" for applications for projects such as building or dredging in tidal wetlands. They clarify the long-standing criteria and standards by which an application is judged as well as incorporating standards and policies listed in Connecticut's Coastal Management Act.

Authority to promulgate the regulations, along with specific topics for the regulations to include, was given by the General Assembly under Public Act 80-356. Public hearings on the proposed regulations were held in April 1980, and comments received from citizens and public officials during that review period were incorporated into the final regulations. As required by Connecticut law, the final regulations were also approved by the Attorney General on June 11, 1980, and by the Legislature's Regulations Review Committee on July 31, 1980.

For copies of the regulations or for further information on the State's tidal wetlands program, contact DEP Water Resources Unit, Room 207, State Office Building, 165 Capitol Avenue, Hartford, Connecticut 06115 (phone 566-7161). Questions concerning the State's coastal management program with respect to tidal wetlands can be directed to CAM Program, 71 Capitol Avenue, Hartford, Connecticut 06115 (phone 566-7404).

Final EIS available

The Final Environmental Impact Statement (FEIS) on the proposed federal approval by the U. S. Department of Commerce of the Connecticut's Coastal Area Management (CAM) Program has been released and is presently available from the CAM office. The Final EIS is a revised version of the Draft EIS which, after public distribution in March, underwent three public hearings and a sixty day (March 28, 1980, through May 28, 1980) review and comment period.

Written comments and hearings testimony were received and reviewed by the Connecticut Department of Environmental Protection and by the U. S. Department of Commerce, Federal Office of Coastal Zone Management. As a result, several changes to the document have been made to reflect comments received by reviewers. Most notably, several appendices have been deleted in the Final EIS, and an "attachment" has been added at the end of the document, which presents a point-by-point summary of all review comments.

A copy of the Final EIS has been mailed out to all those individuals, organizations, and agencies which commented on the Draft EIS. A listing of those receiving the final version can be found in Section VII of the FEIS.

Federal approval, which qualifies Connecticut to receive \$1.3 million in federal funding, was received September 29, 1980. If you have questions, or if you would like copies of the Final EIS or Draft EIS, call 566-7404 or write the CAM Program.

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Hunter's Code

The National Rifle Association offers this hunter's code of ethics:

1. I will consider myself an invited guest of the landowner, seeking his permission, and so conducting myself that I may be welcome in the future.
2. I will obey the rules of safe gun handling and will courteously but firmly insist that others who hunt with me do the same.
3. I will obey all game laws and regulations, and will insist that my companions do likewise.
4. I will do my best to acquire those marksmanship and hunting skills which assure clean, sportsmanlike kills.
5. I will support conservation efforts which can assure good hunting for future generations of America.
6. I will pass along to younger hunters the attitudes and skills essential to a true outdoor sportsman. ■

Regulations for Barkhamsted hunt

Paul Herig, Chief of the Department of Environmental Protection's Wildlife Unit, announced regulations for the controlled deer reduction program that will be conducted by the DEP and the Metropolitan District Commission (MDC) at the MDC's Barkhamsted Reservoir property. The special regulated hunt is being held to bring the deer population into line with what this area can support along with making advantageous use of the area's abundant deer resource.

"The State's deer program's objectives are to maintain healthy and productive deer populations at densities compatible with the carrying capacities of areas as well as with other land uses and to provide a sustained yield of this renewable resource," Herig said. "During a 1978 statewide aerial deer survey, 35 deer per square mile were actually counted wintering in the Barkhamsted reservoir area, a population level double that which remained after a controlled hunt that took place in 1976.

"In 1976 we determined that the area in question, some 5,000 acres or eight square miles, had a deer population far above its carrying capacity. The deer were causing considerable damage to the forest and preventing forest regeneration. Natural environmental losses caused by weather, dogs, coyotes, bobcats, and malnutrition and starvation were insufficient to control the population. The 1976 controlled hunt, which aimed to reduce the area's 1976 deer population by 50 percent, removed 11 deer per square mile during 15 days. Air counts at the close of that hunt revealed 17 deer per square mile still remaining at the close of the hunting period.

"No subsequent controlled hunting was held, and by 1978 the population had doubled, the habitat deterioration was continuing, and one spring dead deer search revealed a six to eight percent starvation rate in the area."

This year's MDC regulated area hunt will be for 12, 16, and 20 gauge shotguns, rifled slug

only (no rifles). It will run from December 8 through December 24 and will be limited to persons in possession of a private land shotgun season permit. No other type permits can be used for this area. State land lottery permits previously selected to hunt on the Tunxis, Peoples, Algonquin, and American Legion State Forest lands in Deer Management Area No. 4 will not be permitted to hunt on the MDC property with their State land permits (nor will MDC permits allow hunting on State lands in Area No. 4).

Persons with a private land shotgun deer permit will be eligible to hunt on the MDC area on a first-come, first-served basis. One-hundred and ten numbered tags will be issued each day at approximately 5:30 a.m. to persons in vehicles parked in the designated area at the MDC Barkhamsted Field Headquarters on Beach Rock Road. Hunters receiving the tags will be processed to enter the area in numerical order at approximately 6 a.m. Each hunter must present a valid private land shotgun permit and a current small game hunting license. The license will be replaced with a special hunting area tag. The MDC will require each hunter entering to sign a liability waiver when arriving at the check-in-area. As any hunters leave during the day persons awaiting entry will be allowed to replace them. Hunters must leave the reservoir area by 5:30 p.m. daily.

Herig adds that persons wishing to hunt the area but not already possessing a private land shotgun deer permit may purchase these permits in the manner described in the "1980 Deer Season Field Guide." Application forms for private land shotgun permits are available from Town Clerks and participating sporting goods dealers around the State. Application cards with the \$10.00 fee must be returned to the DEP accompanied with the Consent Form, with sections for name, mailing address, and signature completed. The hunter should write "MDC" across the space for town, volume, page, and acreage.

Herig cautions persons who purchase a private land shotgun deer permit only for the purpose of hunting on the MDC area that no guarantee is given by the MDC

or the DEP of entry to the area. All hunters will be subject to the first-come, first-served regulation.

Hunters already possessing private land shotgun deer permits will be issued landowner's consent forms during the MDC check-in process. The MDC will not be giving out consent forms as they did in 1976. There will be no additional fees for entry.

For further information, contact the DEP Wildlife Unit, 566-4683.

Smokey & Woodsy 1981 poster contest

Everyone from youngsters through senior citizens is invited to submit a poster on an environmental theme to the 1981 Smokey Bear and Woodsy Owl Poster Contest, sponsored by the National Council of State Garden Clubs, the USDA Forest Service, and the Connecticut State Forestry Unit.

Contest competition divisions are: Kindergarten through second grade; third through fifth grade; sixth through eighth grade; ninth through twelfth grade; over twelfth grade. Maximum size is 12 by 18 inches. There are no restrictions on materials. Label back of poster in lower right hand corner with: name, grade (or age), and home address.

Send your entry no later than January 5, 1981, to:

Mrs. Salvatore Mellone
304 Longmeadow Road
Orange, CT 06477

Forestry forum

Forestry forums for town officials and commission members will be held at Extension Centers in Brooklyn (December 4), Haddam (December 11), and Bethel (December 18) by the Eastern Connecticut and Kingsmark Resource Conservation and Development Committees. The 7 to 9 p.m. panels

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See our December issue for the annual index covering Volume 7.

will include six noted Connecticut forestry professionals who will address issues including land-use planning, taxation, forest management, urban forestry, and legislation. No charge. Register by November 30. For information, contact Thom J. McEvoy, Extension/RC&D Forester, Department of Natural Resources, UCONN, U-87, Storrs, CT 06268. Phone: 486-2840. ■

EPA citizens' briefing

The regional office of the U.S. Environmental Protection Agency will hold its annual New England Citizens' briefing on Friday, December 5, 1980.

The briefing will be held at the Colonial-Hilton in Lynnfield, Massachusetts (off Route 128), from 1:00 p.m. to 5:00 p.m.

Among the issues to be discussed by regional and national experts are: hazardous waste, Douglas M. Castle, EPA Administrator; acid rain, U.S. Representative to Canada Ken Kurtis; and "The Global 2000 Report," co-author and Assistant Secretary of State, Tom Pickering.

For more information, contact the

regional Office of Public Awareness at (617) 233-5779. ■

Public Hearings

November 20, 1980: 2 p.m.
Rm. 221, State Office Bldg.,
Hartford
To consider application of Perkin-Elmer Corporation to discharge 750 gallons per day of pre treated paint spray and phosphate wastewater to the City of Norwalk sanitary sewerage system.

November 21, 1980: 2 p.m.
Rm. 221, State Office Bldg.,
Hartford
To consider application of Town of Portland Parks & Recreation Authority to maintain fill and extend additional fill over inland wetlands and riverward of stream channel encroachment lines in Portland.

November 24, 1980: 10 a.m.
Rm. 161, State Office Bldg.,
Hartford
To consider application of Conn. Dept. of Transportation to reconstruct Buckland Road in Manchester, affecting inland wetlands via installation of pipe arch, channel improvement of unnamed water course, installation of

storm drainage discharge and channel into Buggie Stowe Pond.

Permits Issued

Water Compliance

6/30/80: General Electric Company, Bridgeport
To discharge to Stillman's Pond no more than 14,146,400 gallons per day (average daily flow) of cooling water, and an average daily flow of 125,500 gallons per day of treated metal finishing and cooling waters. Conditions.

6/30/80: The J.J. Ryan Corporation - Rex Forge Division, Plantsville
To discharge to the Quinnipiac River no more than an average daily flow of 30,000 gallons per day of heat treating quench and 10,000 gallons per day of treated metal finishing wastewater. Conditions.

6/30/80: Whyco Chromium Company, Thomaston
To discharge to the Naugatuck River no more than an average daily flow of 85 gallons per minute and an average daily flow of 144,000 gallons per day of waste waters. Conditions.

December 15, 1980: 7:30 p.m.
Orchard Hill Junior High School
Auditorium, 88 Bassitt Road, No.
Haven

Water quality classifications Central Connecticut Coastal Basin

■ If you are concerned about future water quality, the protection of water supply areas, and the siting of solid and hazardous waste facilities in your town, then you should participate in the State Water Quality classification planning process. DEP is holding this public hearing to consider the Central Connecticut

Coastal Basin Water Quality Standards for all surface and groundwaters.

Towns included in this basin are: Bethany, Branford, Bristol, Cheshire, Clinton, Durham, East Haven, Guilford, Hamden, Killingworth, Madison, Meriden, Milford, New Britain, New Haven, North Branford, North Haven, Old Saybrook, Orange, Plainville, Prospect, Southington, Wallingford, Westbrook, West Haven, Wolcott, and Woodbridge.

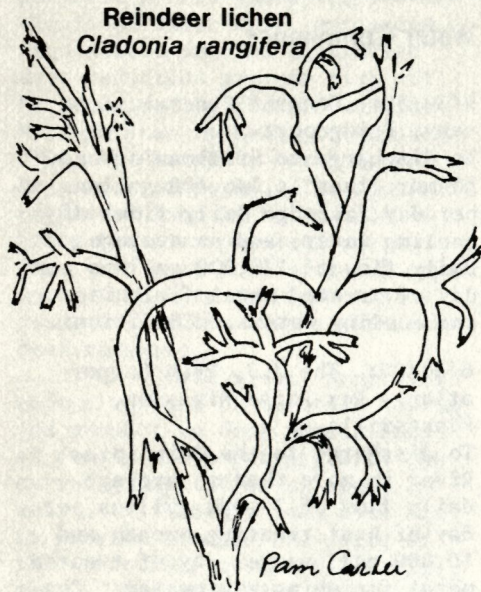
Over a year ago, the department recognized the stresses being placed upon our lands and waters by competing uses, reflected in numerous occurrences of well contamination from past disposal practices as well as pressures for new landfill sites and hazardous waste disposal facilities. The DEP has placed

all available data on maps which show water resources of the State and all waste disposal and public water supply activities. Public input is now needed to help form and adapt the specific Basin's water quality classifications consistent with already adopted water quality standards and policies.

The public is urged to work together with DEP to help develop the water quality classifications. Information and decisions need to be made on a local level by town officials, private citizens, and public and private interest groups. The decisions made at the HEARING will set goals and direct Connecticut's water pollution control activities in this basin. Adopted classifications of surface and groundwater will insure proper protection of our most valuable resource. CLEAN WATER IS EVERYONE'S CONCERN. ■

Trailside Botanizing

by G. Winston Carter



Reindeer lichen is a curly grey groundcover which is usually found beneath pines and spruces. It often resembles frosty grey patches when interspersed with a carpet of green moss. These patches sometimes may be very extensive.

Lichens are very primitive plants which are actually two different types of plants, fungi and algae, living together to ensure the survival of each. The algae produce food for the fungi, which, in return, provide a supply of water to keep them from drying out. For millions of years, lichens have produced minute quantities of soil through the secretion of strong acids, helping to lay the groundwork of forests.

Lichens thrive in places which would be intolerable to most plants. They are able to withstand heat, exposure, cold, dryness, and even a lack of food. Lack of lichens is often an indicator of the degree of pollution in the air, because they are unable to rid themselves of these

toxic substances when they are taken in with water. Another form of contamination, Strontium 90 from radio-active fall-out, settles on the reindeer lichen in Arctic regions. Reindeer lichen is the favorite and often sole food of the caribou, reindeer, and other grazing animals of the North. The Eskimo eat the reindeer and become susceptible to cancer as a result.

Lichens, though small and rather insignificant in appearance, play some important roles in our environment.

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DEP Citizens' Bulletin

State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

SECOND CLASS POSTAGE PAID
AT HARTFORD, CONNECTICUT